

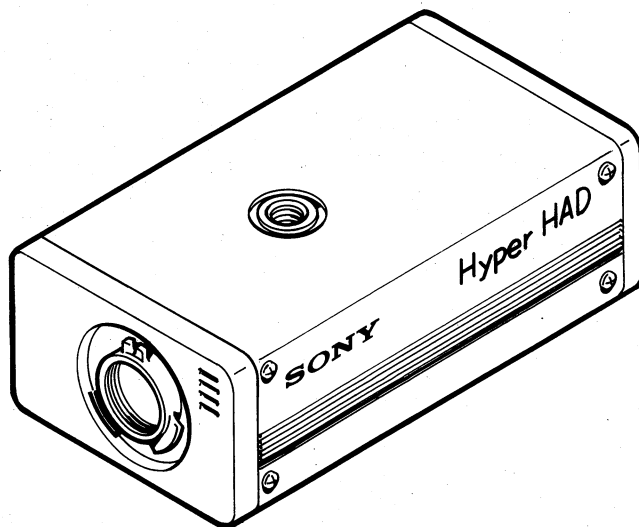
SONY

CCD Black-and-White Video Camera

HVM-352/354

HVM-52H/54H

SERVICE MANUAL



Hyper HAD™

SECTION 1 GENERAL

1-1. FEATURES	1-1
1-2. LOCATION AND FUNCTION OF PARTS	1-1
1-3. PRECAUTIONS	1-2
1-4. CONNECTIONS	1-2
1-5. INSTALLATION	1-2
1-6. FOCUS ADJUSTING	1-3
1-7. SPECIFICATIONS	1-3

SECTION 2 SERVICE INFORMATION

2-1. Removal of the main parts	2-1
2-2. Replacement of the CCD Block	2-3
2-3. Extension Board	2-4

SECTION 3 THEORY OF OPERATION

3-1. BI-63 BOARD	3-1
3-2. CB-51 BOARD	3-1
3-3. VB-001 BOARD	3-1
3-4. RG-30 BOARD	3-1
3-5. CN-768 BOARD	3-1

SAFETY RELATED COMPONENT WARNING

Components identified by shading and  marked on the schematic diagrams and parts list are critical to safe operation. Replace these components with SONY parts whose part numbers appear as shown in this manual or in supplements published by SONY.

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.



This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

For customers in the U.S.A.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

SECTION 4 ADJUSTMENT

4-1. PREPARATION	4-1
4-2. FLANGE BACK ADJUSTMENT	4-2
4-3. SIGNAL PROCESS SECTION	4-2

SECTION 5 DIAGRAMS

5-1. BLOCK DIAGRAM	5-1
5-2. BOARD LOCATION	5-1
5-3. SCHEMATIC DIAGRAMS AND PRINTED CIRCUIT BOARDS	5-2
5-4. SEMICONDUCTOR	5-4

SECTION 6 REPAIR PARTS

6-1. EXPLODED VIEW AND PARTS LIST	6-1
6-2. ELECTRICAL PARTS LIST	6-2
6-3. PACKING MATERIAL AND ACCESSORY	6-4

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

For customers in Canada

This apparatus complies with the Class B limits for radio noise emissions set out in Radio Interference Regulations.

Pour les utilisateurs au Canada

Cet appareil est conforme aux normes Classe B pour bruits radioélectriques, spécifiés dans le Règlement sur le brouillage radioélectrique.

Bescheinigung des Herstellers

Hiermit wird bescheinigt, daß die Schwarzweiß-Videokamera HVM-354 in Übereinstimmung mit den Bestimmungen der Amtsblattverfügung Nr. 1046/1984 funktentstört ist. Der Deutschen Bundespost wurde das Inverkehrbringen dieses Gerätes angezeigt und die Berechtigung zur Überprüfung der Serie auf Einhaltung der Bestimmungen eingeräumt. Sony Corporation

Hinweis

Gemäß dem Amtsblatt des Bundesministers für das Post- und Fernmeldewesen Nr. 163/1984 wird der Betreiber darauf aufmerksam gemacht, daß die von ihm mit diesem Gerät zusammengestellte Anlage auch den technischen Bestimmungen dieses Amtsblattes genügen muß.

SECTION1

GENERAL

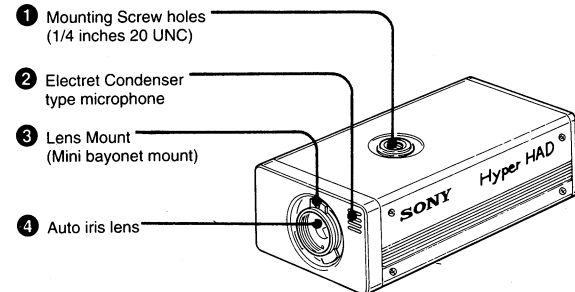
1-1. FEATURES

The HVM-352/354/52H/54H is a high sensitive, compact and lightweight monochrome video camera which uses a CCD (Charge Coupled Device), a new developed 1/2-inch Hyper HAD sensor. It is principally used for a simple camera surveillance.

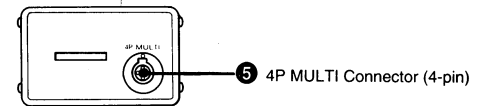
- About 250,000/290,000 picture elements give a high quality picture.
- Low lag, no image burning and precise image geometry.
- Quick start-up when turning on the power.
- Stable picture obtained even when shooting in a strong magnetic field.
- Possible to take pictures while moving.
- Auto-iris lens and auto-gain control provided.
- Focus adjustable.
- Equipped with 4-pin MULTI connector for video and audio outputs.
- Special mini-bayonet lens mount for attaching an optional wide attachment lens.
- Built-in electret condenser microphone.

1-2. LOCATION AND FUNCTION OF PARTS

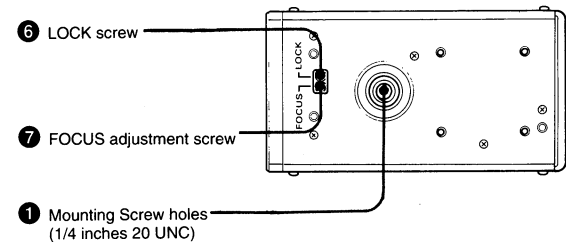
Front Panel



Rear Panel



Bottom Panel



1 Mounting Screw holes (1/4 inches 20 UNC)

Use this hole mount the camera on a wall, ceiling or on a tripod.

2 Electret condenser type microphone

This microphone is very small size, equipped with the high resistance function to humidity, temperature, vibration and magnetism.

3 Lens mount (Mini bayonet mount)

Attach an optional wide attachment lens. (VCL-04HS or VCL-06HS wide attachment lens, etc.)

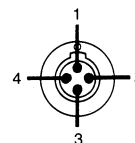
4 Auto iris lens

Equipped with the auto iris control function.

5 4P MULTI connector (4-pin)

Connect to the 4P MULTI IN connector of the camera adaptor (not supplied).

Pin assignment



Pin NO.	Signal
1	DC Input
2	Video Output 1.0 Vp-p, 75 ohms, sync negative
3	GND
4	Audio Output -5 dBs (436 mVrms), less than 10 kilohms

6 LOCK screw

Used to lock the FOCUS adjustment screw.

7 FOCUS adjustment screw

Used to adjust the focus of the camera.

1-3. PRECAUTIONS

Notes on Use

Power supply

Be sure to operate the camera on 6V to 12V DC power.

Do not disassemble

Do not open the casing. Do not touch any internal precision components as they may be damaged.

Keep foreign matters out of the casing

Should any liquid or solid object fall into the cabinet, have the camera checked by qualified personnel before operating it any further.

Keep well ventilated

Allow adequate air circulation to prevent internal heat build-up.

Operating or storage location

Avoid operating or storing the camera in the following locations:

- Extremely hot or cold locations.
- Damp or dusty locations.
- Where it is exposed to rain.
- Where it is subject to strong vibrations.
- Where it is close to generators of powerful electromagnetic radiation such as radio or TV transmitters.

Repacking

Do not discard the carton. It affords maximum protection whenever the camera is transported. Repack the camera as it was originally packed at the factory.

Cleaning

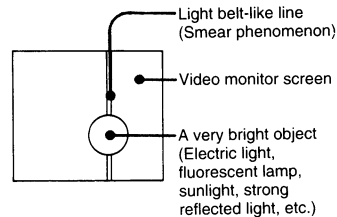
Clean the cabinet, panel and controls with a dry soft cloth or soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent such as alcohol or benzene, which might damage the finish.

Typical CCD Phenomena

Because of the high sensitivity of the CCD image sensors, the following phenomena may appear on the monitor screen while you are using the camera. These phenomena do not mean that there is anything wrong with the camera.

Smear phenomenon

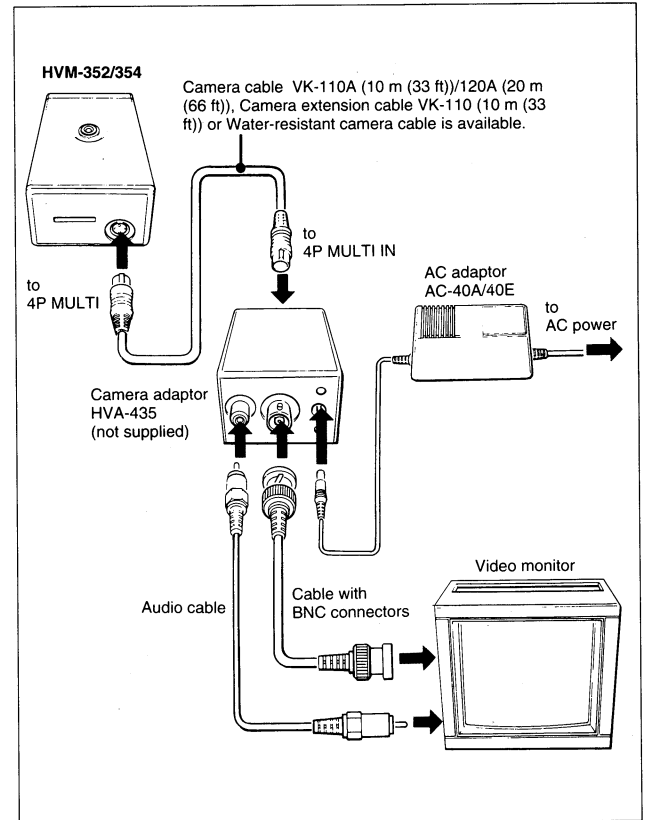
A light belt-like line (Smear phenomenon) may appear on the monitor screen when a very bright object (electric light, fluorescent lamp, sunlight, strong reflected light, etc.) is shot. Use the optional infrared cut filter to reduce it.



Wavy picture

This may occur when fine stripes, straight lines, etc., are shot.

1-4. CONNECTIONS



1-5. INSTALLATION

Installing on a wall or ceiling

To install the camera on a wall or ceiling, use an appropriate support or bracket and a mounting screw as specified below, which matches both the Mounting Screw holes on the top and on the bottom of the camera body.

Mounting on a tripod

To mount the camera on a tripod, use the Mounting Screw holes on the bottom of the camera body.

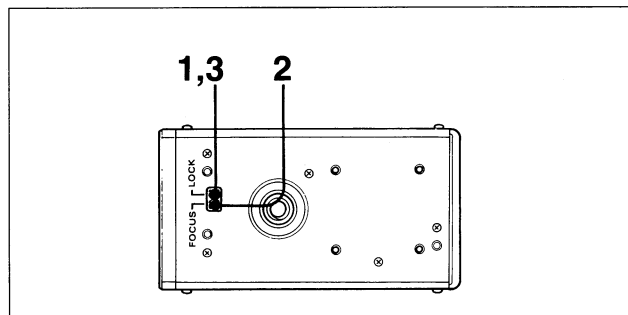
Mounting screw to be used

1/4 inches 20 UNC
 $\varnothing$: 4.5 mm $\pm$ 0.2 mm (ISO standard)
 : 0.197 inches (ASA standard)



1-6. FOCUS ADJUSTING

The focus of the camera is factory-preset to 3 m (9.8 feet). It can be adjusted within the range of 0.3 m (11 7/8 inches) to ∞ (infinity) as follows.



- 1** Turn the LOCK screw counterclockwise to loosen it.
- 2** While observing an object through a monitor, turn the FOCUS adjustment screw until sharp focus is obtained.
- 3** Turn the LOCK screw clockwise to fasten it.

1-7. SPECIFICATIONS

Pickup Device

Pickup device	Interline-transfer CCD
Picture elements (effective)	HVM-352/52H: 510 x 492 (h/v) HVM-354/54H: 500 x 582 (h/v)
Sensing area	6.4 mm x 4.8 mm (equivalent to a 1/2-inch pickup tube)

Optical

Lens	f=11 mm, F1.8, auto-iris with mini bayonet mount
Minimum illumination	0.7 lx
Recommended illumination	More than 400 lx

Signal System

Signal system	EIA/CCIR standards
Scanning system	525/625 lines, 2:1 interlace, 30/25 frames/sec.
Sync system	Internal

Performance

Horizontal resolution	380 TV lines
-----------------------	--------------

General

Power requirements	6 V to 12 V DC
Power consumption	0.2 A
Operating temperature	0°C to 50°C (32°F to 122°F)
Storage temperature	-30°C to +60°C (-22°F to +140°F)
Shock resistance	70G
Dimensions	Approx. 52 x 32 x 100 mm (w/h/d) (2 1/8 x 1 5/16 x 3 15/16 inches)
Mass	220 g (16 oz)

Accessories Supplied (HVM-352/354 only)

Operating instructions (1)

Accessories not Supplied

Lenses

Wide angle Supplementary Lens VCL-04HS (Photo angle: about 110 degrees)
Wide angle Supplementary Lens VCL-06HS (Photo angle: about 70 degrees)
Pinhole lens VCL-06PH

Camera adaptors

Camera adaptor HVA-435
AC adaptor AC-40A/40E (DC 6 V)

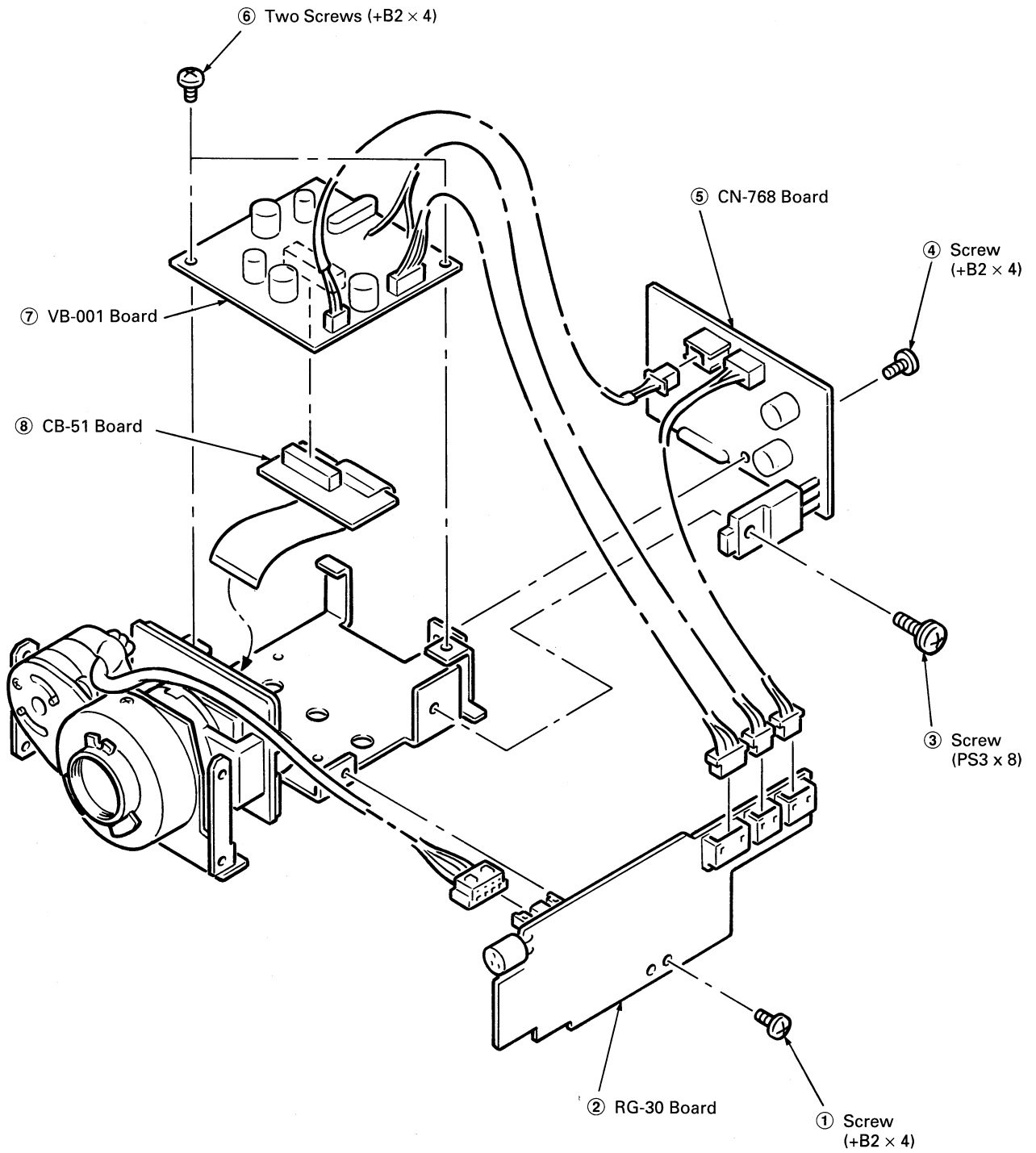
Camera cables

Camera cable VK-110A: 10 m (33 ft), VK-120A: 20 m (66 ft)
Camera cable VK-30C: 0.3 m (11 7/8 inches) (female four-pin connector ↔ male BNC)
Camera cable VK-30D: 0.3 m (11 7/8 inches) (male BNC ↔ male four-pin connector)
Camera extension cable VK-110: 10 m (33 ft)
Water-resistant camera cable VK-220: 20 m (66 ft))

Others

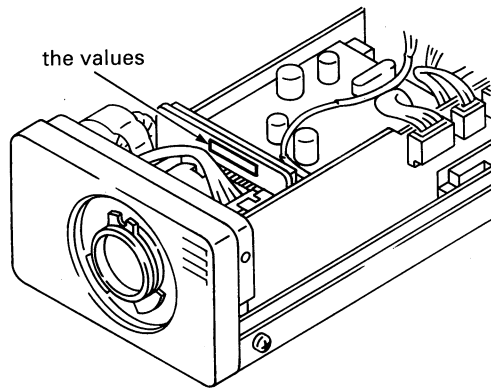
Water-resistant camera case WPC-140

2-1-2. Removal of the RG-30, CN-768, CB-51, VB-001 Boards



2-2. REPLACEMENT OF CCD BLOCK

Each CCD's own values of the VSUB is required for the adjustment. This value is shown at the CCD block assy.



2-3. EXTENSION BOARD

Use for extension between VB-001 board and CB-51 board.

Part No.: 1-589-415-11

Description: PC BOARD ASSY, FLEXIBLE

SECTION 3

THEORY OF OPERATION

3-1. B1-63 BOARD

This board has a CCD imager which converts light into electric charge. For the output from IC101, the electric charge is converted into the voltage signal in the capacitor of the output block, and output. It is then transferred to the VB-001 board via the Q101 buffer.

3-2. CB-51 BOARD

Conversion board from the 18-pin CN701 to the 13-pin W701.

3-3. VB-001 BOARD

The board has the following blocks.

- ① 1-chip Process for CCD Black and White Camera (IC401)
(Sample and Hold/AGC/Processor)
- ② Timing Signal for CCD and Sync Signal Generator (IC301)
- ③ CCD Vertical Transfer Clock Driver (IC201)
- ④ V SUB Voltage Supply (Q201, Q202)
- ⑤ Reset Gate Clock Voltage Supply (Q203)

① Sample and Hold/AGC/Processor

The signal output from the CCD imager is branched into the DATA signal and PG signal, and both are input into IC401. The signals undergo sample and hold in each timing (SHP, SHD1, SHD2) and pass through the AGC amplifier after signal separation. The separated signals are detected by the external detection circuit and an appropriate value is maintained. The video signal is output after passing through the circuits such as external trap, γ , white clip, setup, SYNC, and driver.

② Timing Signal for CCD and Sync Signal Generator

IC301 generates the clock, sample and hold, and clamp pulse signals required for driving the CCD according to 28 MHz basic clock. Also, the various timing signals required to create the video signal are generated.

- BLK: Blanking signal (to IC401)
- SYNC: Composite sync signal (to IC401)
- H1, H3: Horizontal register driving pulse (to CCD imager)
- XV1 to XV4: Vertical register driving pulse (to IC201)
- XSG1, 2: Sensor charge read pulse (to IC201)
- X SUB: Charge discard pulse for shutter speed control (to IC201)
- XSHP, XSHD: Signal separation sample and hold pulse (to IC401)
- CLP1, 3: Clamp pulse (to IC401)

Above signals are output.

③ CCD Vertical Transfer Clock Driver

XV1 to XV4, XSG1 to XSG2, and X SUB (charge discard pulse) output from IC301 are driven through IC201 and supplied to the CCD imager.

④ V SUB Voltage Supply

This circuit supplies the specified voltage to the overflow drain of the CCD imager. The Q201, Q202 are regulators whose standard voltage is V SUB control voltage.

⑤ Reset Gate Clock Voltage Supply

This circuit supplies the specified voltage to the reset gate of the CCD imager to which IC301 supplies the reset gate pulse.

3-4. RG-30 BOARD

① Voltage conversion circuit

The HD pulse is input from the VB-001 board to IC501. It undergoes waveform shaping in IC501, and the positive output passes through the Q501 and Q502 buffers. The reversed output also passes through the Q503 and Q504 buffers.

The square waveforms of the positive and reversed outputs are accumulated for their voltages using D501, D502, D503, C504 to C508 to make the approximately 22V DC. This DC is input to the 3-pin regulator of IC502 to make 15V, which is supplied to the VB-001 board.

In the same way, an approximately -13V DC is made by D504, D505, C510 to C513. It is input to the 3-pin regulator of IC503 to make -9V.

② Auto Iris Operation Circuit

The IRIS-OUT output from the VB-001 board is detected by Q505, passes through Q506 buffer, amplified by IC504 and supplied to the auto iris lens.

③ Mic output circuit

The audio signal output from the electret condenser mic MIC501 is amplified by IC504 and transmitted to the CN-768 board.

3-5. CN-768 BOARD

Connector board for various input/output.

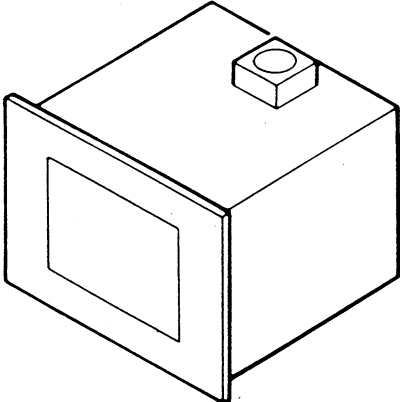
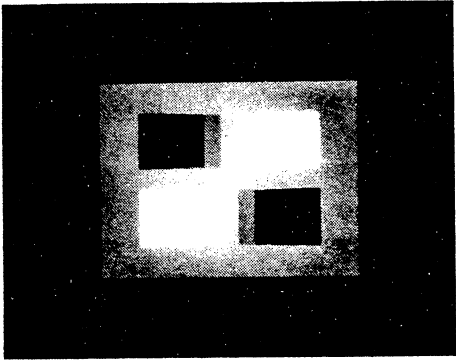
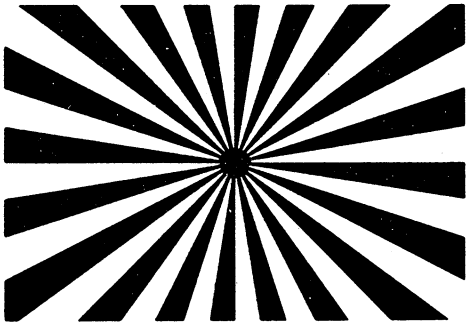
The power supply input from Pin 4 of CN601 passes through the filter (FL601), the fuse (F601), the 3-pin regulator of IC601, and is output as 5V. This 5V is transferred to the RG-30 board to make +15V and -9V.

The VIDEO and AUDIO outputs pass through the filter and are output outside from CN601.

SECTION 4
ALIGNMENT

4-1. PREPARATION

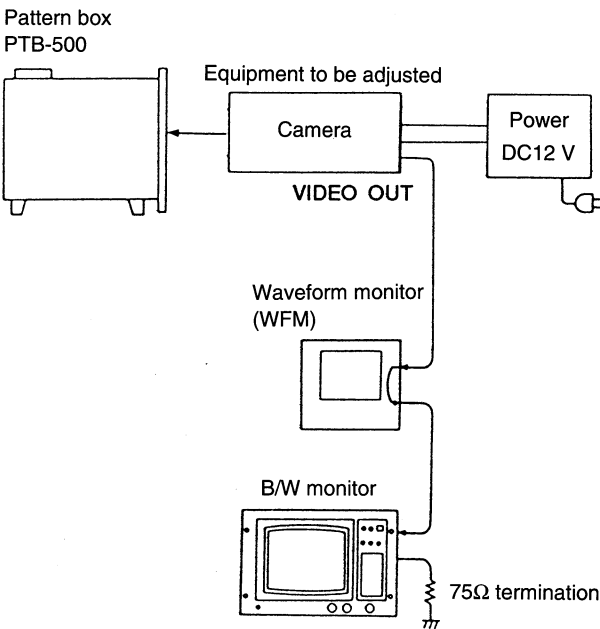
4-1-1. Adjustment Fixture and Equipment

J-6029-140-A	Pattern Box PTB-500
* Light source for test chart, AC90 to 240 V	
	
J-6026-130-B	Gray Scale Chart
For adjusting the video level and gamma, etc.	
	
J-6024-340-B	Siemens Star Chart
For adjusting the back focus	
	

Products commercially available

- Dual trace oscilloscope
 - Waveform monitor
 - Digital voltmeter
 - B/W monitor
 - ND filter
- ND0.15 (0.15%) 50 mm square made by Kenko
ND0.01 (0.01%) 50 mm square made by Kenko

4-1-2. Connection Diagram



4-2. FLANGE BACK ADJUSTMENT

Subject: Siemens star chart

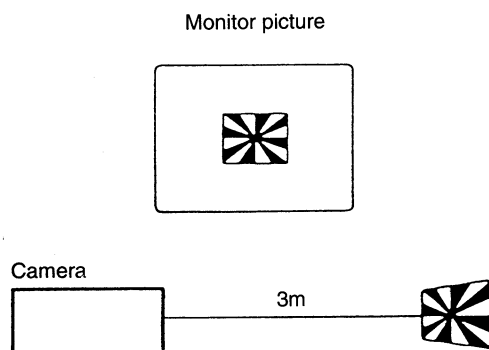
Equipment: B/W monitor

Measurement point: VIDEO OUT

Adjustment method:

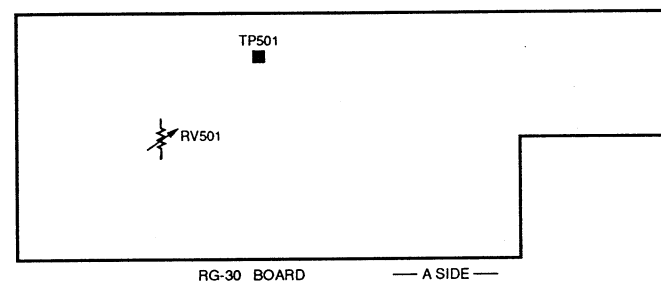
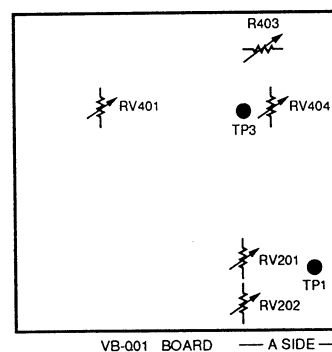
Refer to 1-6. FOCUS ADJUSTING (page 1-3)

1. Loosen the locking screw.
2. Expose the Siemens star chart and adjust the focus to optimum with the focus screw.
3. Tighten the lock screw.



4-3. SIGNAL PROCESS SECTION

Adjustment point



4-3-1. V SUB Voltage

Subject: Close "C"

Equipment: Digital voltmeter

Measurement point: TP1 on VB-001 board

Adjustment point: RV201 on VB-001 board

Specified value: Setting value $\pm$ 0.15V

Adjustment method: Adjust to the voltage setting value corresponding to the symbols (2 digit symbols) of the V SUB voltage displayed at the back of the CCD block, according to the table.

Refer to 2-2. When replacing CCD block (page 2-3)

Symbols (1st digit)	Numbers	Symbols (1st digit)	Numbers
7	7	E	14
8	8	F	15
9	9	G	16
A	10	H	17
B	11	I	18
C	12	J	19
D	13		

1st digit (upper): Whole numbers are displayed in symbols.

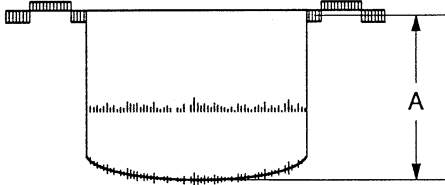
2nd digit (lower): Decimals are displayed in numbers.
(E.g.)F5 $\rightarrow$ 15.5(V)

4-3-2. PGLL**STEP 1**

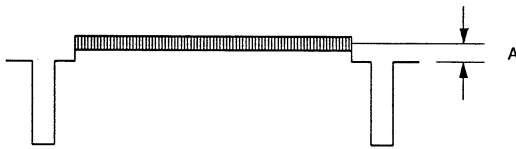
Subject: All white pattern
 Equipment: Digital voltmeter
 Measurement point: TP501 on RG-30 board
 Adjustment point: RV501 on RG-30 board
 Specified Value: Above 2.6 V DC

STEP 2

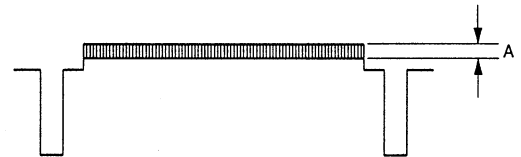
Subject: All white pattern
 Equipment: Oscilloscope (DC100 mV 10 μ S)
 Measurement point: TP3 of VB-001 board
 Adjustment point: RV202 on VB-001 board
 Adjustment method: Rotate RV202 in the clockwise direction slowly and adjust until level A is maximum.

**4-3-3. Pedestal**

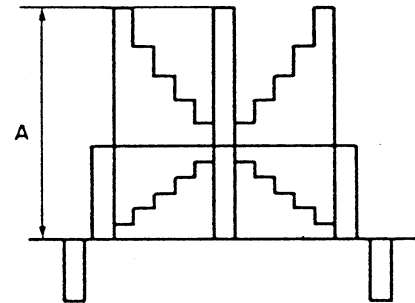
Subject: Close "C"
 Equipment: Waveform monitor
 Measurement point: VIDEO OUT
 Adjustment point: RV401 on VB-001 board
 Specified Value: (EIA) $A=7\pm 2$ IRE
 (CCIR) $A=30\pm 15$ mV

**4-3-4. AGC Level****STEP 1**

Subject: Close "C"
 Equipment: Waveform monitor
 Measurement point: VIDEO OUT
 Adjustment point: RV403 on VB-001 board
 Adjustment method: Adjust RV403 so that A is maximum.

**STEP 2**

Subject: Gray scale chart
 Equipment: Waveform monitor
 Measurement point: VIDEO OUT
 Adjustment point: RV404 on VB-001 board
 Specified Value: (EIA) $A=100 \pm 2$ IRE
 (CCIR) $A=700 \pm 15$ mV
 Adjustment method: Attach a ND filter (0.15%) on the lens and adjust.



4-3-5. GAIN

Subject: Gray scale chart

Equipment: Waveform monitor

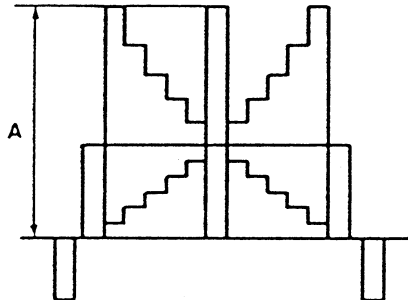
Measurement point: VIDEO OUT

Adjustment point: RV403 on VB-001 board

Specified Value: (EIA) $A=65\pm 2$ IRE

(CCIR) $A=455\pm 15$ mV

Adjustment method: Attach a ND filter (0.01%) on the lens
and adjust.

**4-3-6. Auto Iris Level**

Subject: Gray scale chart

Equipment: Digital voltmeter

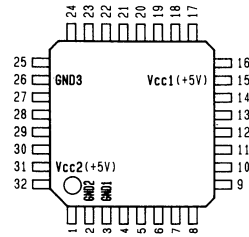
Measurement point: TP501 on RG-30 board

Adjustment point: RV501 on RG-30 board

Specified Value: 1.45 ± 0.02 V

IC

CXA1310AQ (SONY)
I-CHIP PROCESS FOR CCD BLACK AND WHITE
- TOP VIEW -



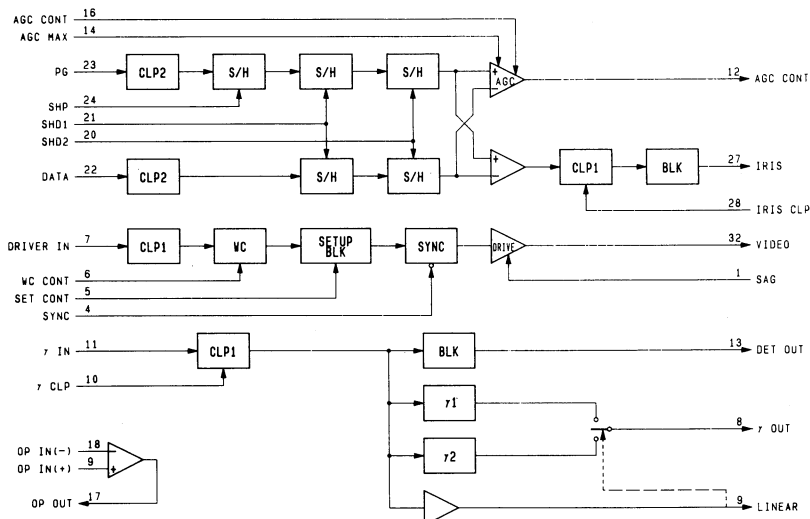
PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL
1	I	SAG	17	O	OP OUT
2	-	GND2	18	I	OP IN (-)
3	-	GND1	19	I	OP IN (+)
4	I	SYNC	20	I	SHD2
5	I	SET CONT	21	I	SHD1
6	I	WC CONT	22	I	DATA
7	I	DRIVER IN	23	I	PG
8	O	Y OUT	24	I	SHP
9	O	LINEAR	25	I	CLP2
10	I	Y CLP	26	-	GND3
11	I	Y IN	27	O	IRIS
12	O	AGC OUT	28	I	IRIS CLP
13	O	DET OUT	29	I	BLK
14	I	AGC MAX	30	I	CLP1
15	-	Vcc1	31	-	Vcc2
16	I	AGC CONT	32	O	VIDEO

INPUT

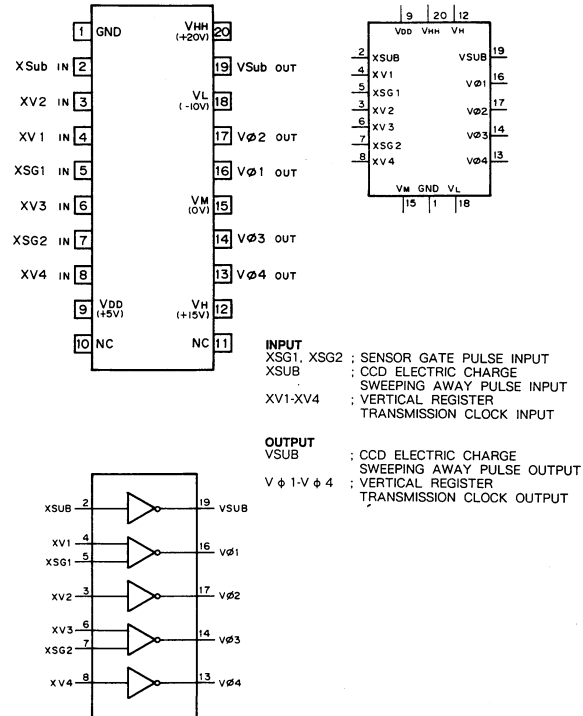
AGC CONT : AGC AMPLIFIER GAIN CONTROL
AGC MAX : AGC AMPLIFIER MAX GAIN
BLK : BLK PULSE INPUT
CLP1, 2 : CLP1, 2 PULSE INPUT
DATA : CCD SIGNAL INPUT
DRIVER IN : DRIVER INPUT
IRIS CLP : IRIS OUTPUT CLAMP
OP IN (+) : OPERATIONAL AMPLIFIER NON-TURX INPUT
OP IN (-) : OPERATIONAL AMPLIFIER TURN INPUT
PG : CCD SIGNAL INPUT
SAG : SAG CORRECTION SIGNAL INPUT
SET CONT : SETUP LEVEL ADJUSTMENT
SHD1, 2 : SAMPLE HOLD PULSE INPUT
SHP : SAMPLE HOLD PULSE INPUT
SYNC : SYNC PULSE INPUT
WC CONT : WHITE CLIP LEVEL ADJUSTMENT
Y CLP : Y INPUT CLAMP
Y IN : Y ADJUSTMENT INPUT

OUTPUT

AGC OUT : AGC SIGNAL OUTPUT
DET OUT : AGC DETECTION SIGNAL OUTPUT
IRIS : IRIS CONTROL SIGNAL OUTPUT
LINEAR : LINEAR SIGNAL OUTPUT
OP OUT : OPERATIONAL AMPLIFIER OUTPUT
VIDEO : VIDEO SIGNAL OUTPUT
Y OUT : Y CORRECTION SIGNAL OUTPUT

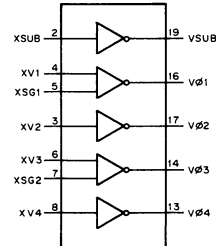


CXD1250N (SONY) FLAT PACKAGE
C-MOS VERTICAL CLOCK DRIVER FOR CCD
- TOP VIEW -



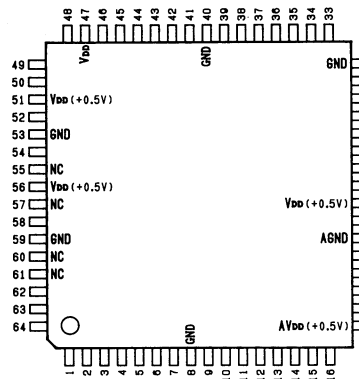
INPUT
XSG1, XSG2 : SENSOR GATE PULSE INPUT
XSUB : CCD ELECTRIC CHARGE
SWEEPING AWAY PULSE INPUT
XV1-XV4 : VERTICAL REGISTER
TRANSMISSION CLOCK INPUT

OUTPUT
VSub : CCD ELECTRIC CHARGE
SWEEPING AWAY PULSE OUTPUT
Vφ1-Vφ4 : VERTICAL REGISTER
TRANSMISSION CLOCK OUTPUT



HVM-351 (J)
HVM-352 (UC)
HVM-52H (UCJ)
HVM-354/54H (EK)

CXD1254AR (SONY)
C-MOS TIMING SIGNAL GENERATOR FOR CCD
- TOP VIEW -

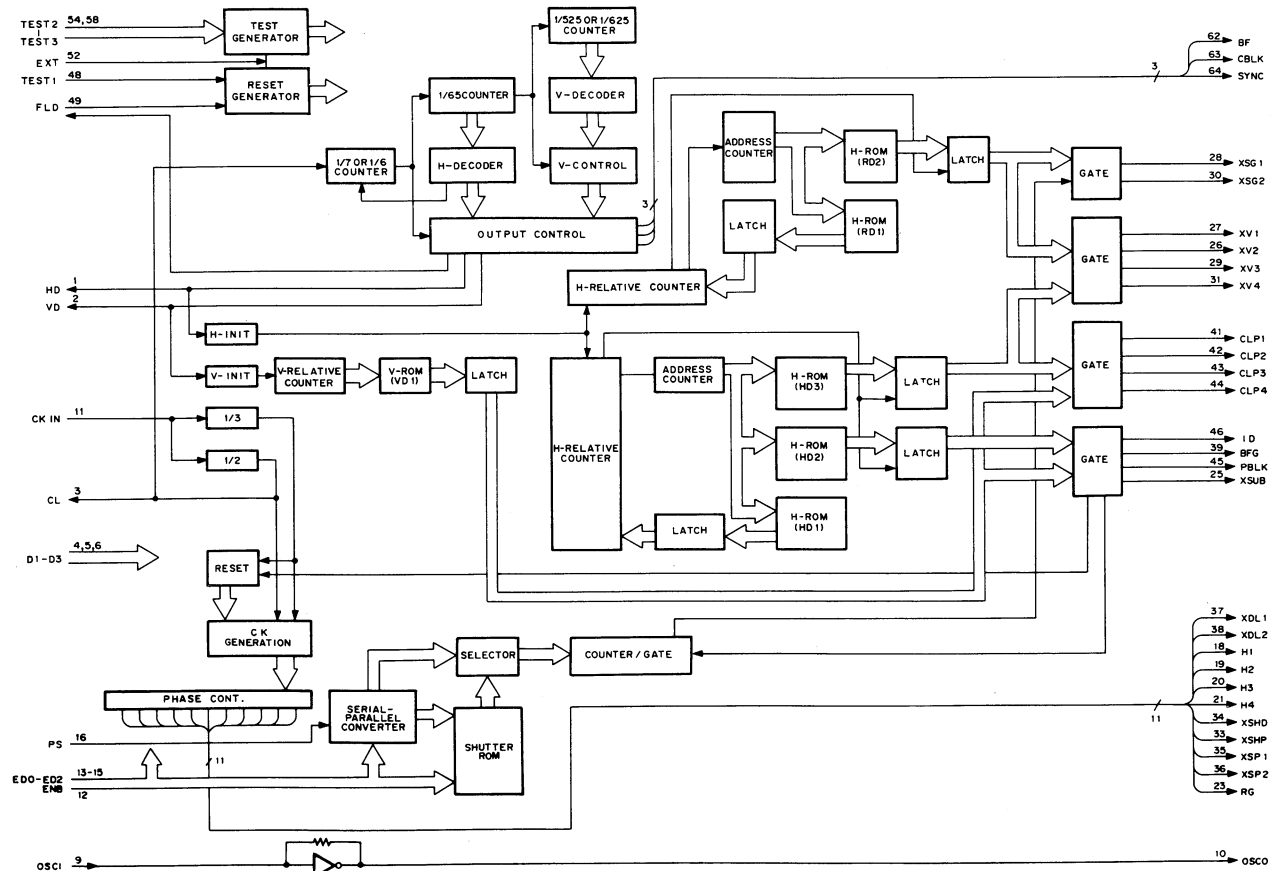


PIN NO.	I/O	SIGNAL	PIN NO.	I/O	SIGNAL	PIN NO.	I/O	SIGNAL	PIN NO.	I/O	SIGNAL
1	O	HD	17	-	AVDD	33	O	XSHD	49	I/O	FLD
2	O	VD	18	O	H1	34	O	XSHD	50	I	HTSG
3	O	CL	19	O	H2	35	O	XSP1	51	-	VDD
4	I	D1	20	O	H3	36	O	XSP2	52	I	EXT
5	I	D2	21	O	H4	37	O	XDL1	53	-	VSS
6	I	D3	22	-	AVSS	38	O	XDL2	54	I	TEST2
7	I	TRIG	23	O	RG	39	O	BFG	55	-	NC
8	-	VSS	24	-	VDD	40	-	VSS	56	-	VDD
9	I	OSCI	25	O	XSUB	41	O	CLP1	57	-	NC
10	O	OSCO	26	O	XV2	42	O	CLP2	58	I	TEST3
11	I	CKIN	27	O	XV1	43	O	CLP3	59	-	VSS
12	I	ENB	28	O	XSG1	44	O	CLP4	60	-	NC
13	I	ED0	29	O	XV3	45	O	PBLK	61	-	NC
14	I	ED1	30	O	XSG2	46	O	ID	62	O	BF
15	I	ED2	31	O	XV4	47	-	VDD	63	O	CBLK
16	I	PS	32	-	VSS	48	I	TEST1	64	O	SYNC

MODE	PIN NO.	PRESET	0	1
D1	4	0	NTSC/EIA	CCIR
D2	5	0	NORMAL IMAGE	MIRROR IMAGE
D3	6	0	COLOR	B/W
ENB	12	1	NORMAL	SHUTTER
ED0	13	1	SHUTTER SPEED	
ED1	14	1		
ED2	15	1		
PS	16	1	SERIAL INPUT	PARALLEL INPUT
EXT	52	0	INTERNAL	EXTERNAL
TEST2	54	0	NORMALLY LOW	

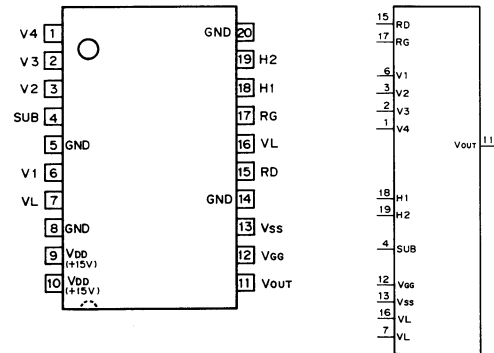
0 : LOW LEVEL
1 : HIGH LEVEL

52	EXT	1	HD	1	INPUT
49	FLD	2	VD	2	CKIN
9	OSCI	10	OSCO	10	D1-D3
48	TEST1	62	EXT	62	ED0-ED2
54	TEST2	63	CBLK	63	ENB
58	TEST3	64	SYNC	64	EXT
11	CKIN	23	RG	23	HTSG
4	D1	41	CLP1	41	OSCI
5	D2	42	CLP2	42	PS
6	D3	43	CLP3	43	TEST1
19	ED0	44	CLP4	44	TEST2-TEST3
14	ED1	27	XV1	27	TRIG
15	ED2	26	XV2	26	INPUT
12	ENB	29	XV3	29	OUTPUT
		31	XV4	31	BF
		46	PBLK	46	BFG
		39	RG	39	CBLK
		45	SYNC	45	CL
		25	VD	25	CLP1-CLP4
		37	XSUB	37	H1-H4
		38	XDL1	38	HD
		39	XDL2	39	LINE DISCRIMINATION PULSE
		40	XSG1	40	OSCO
		41	XSG2	41	PBLK
		42	XSHD	42	RG
		43	XSP1	43	SYNC
		44	XSP2	44	VD
		45	XSUB	45	XDL1-XDL2
		46	XV1	46	SENSOR ELECTRIC CHARGE READ OUT PULSE
		47	XV2	47	DATA, SAMPLE HOLD PULSE
		48	XV3	48	XSHD
		49	XV4	49	PRECHARGE LEVEL, SAMPLE HOLD PULSE
		50		50	XSP1-XSP2
		51		51	CHROMA SEPARATION, SAMPLE HOLD PULSE
		52		52	XSUB
		53		53	ELECTRIC CHARGE SWEEPING AWAY PULSE
		54		54	XV1-XV4
		55		55	CLOCK PULSE FOR DRIVING VERTICAL REGISTER
		56		56	INPUT/OUTPUT
		57		57	FLD
		58		58	FIELD PULSE OUTPUT/V RESET PULSE INPUT
		59		59	
		60		60	
		61		61	
		62		62	
		63		63	
		64		64	

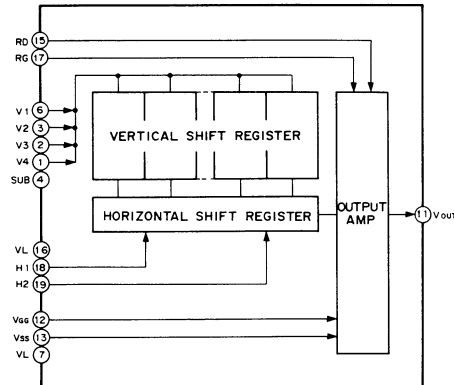


HVM-351 (J)
HVM-352 (UC)
HVM-52H (UCJ)
HVM-354/54H (EK)

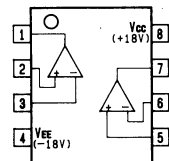
ICX026BLA-A (SONY) (NTSC, MONOCHROME)
ICX027BLA-A (SONY) (PAL, MONOCHROME)
1/2-INCH CCD IMAGE BLOCK
- TOP VIEW -



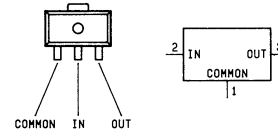
H1, H2 : HORIZONTAL REGISTER TRANSFER CLOCK
RD : RESET DRAIN BIAS
RG : RESET GATE CLOCK
SUB : OVERFLOW DRAIN
VGG : OUTPUT AMP GATE BIAS
VL : PROTECTION TRANSISTOR BIAS
VSS : OUTPUT AMP SOURCE
V1 - V4 : VERTICAL REGISTER TRANSFER CLOCK
VOUT : SIGNAL OUTPUT



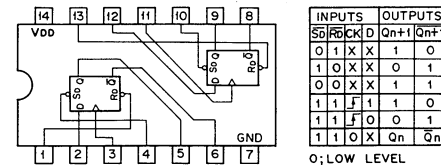
NJM3404AM (JRC) FLAT PACKAGE
RC3404AM (RAYTHEON) FLAT PACKAGE
DUAL SINGLE SUPPLY OPERATION AMPLIFIER
- TOP VIEW -



NJM79L09UA (JRC) - 9V
NEGATIVE VOLTAGE REGULATOR (100mA)

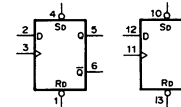


SN74HC74ANS (TI) FLAT PACKAGE
CMOS DUAL D-TYPE FLIP-FLOPS WITH DIRECT SET/RESET
- TOP VIEW -



INPUTS	OUTPUTS
5D RCK D Qn+1 Qn+1	
0 1 X X	1 0
1 0 X X	0 1
0 0 X X	1 1
1 1 X X	0 0
1 1 1 1	0 1
1 1 0 0	1 0
1 1 0 X	Qn Qn

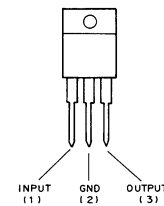
0; LOW LEVEL
1; HIGH LEVEL
X; DON'T CARE



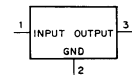
NOTE :

TYPE	VDD
TC74HCT74AF	+5V
TC74ACT74 TYPE	+2 to +5.5V
74ACT74 TYPE	+4.5 to +5.5V
OTHER TYPES	+2 to +6V

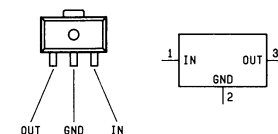
UPC24M05HF (NEC)
POSITIVE VOLTAGE REGULATOR
- FRONT VIEW -



UPC2408HF : +8V (2.2A)
UPC2412HF : +12V (2.2A)
UPC24M05HF : +5V (0.5A)
UPC24M09HF : +9V (0.5A)
UPC24M12HF : +12V (0.5A)



UPC78L15T (NEC) + 15V
POSITIVE VOLTAGE REGULATOR (100mA)



HVM-351 (J)
HVM-352 (UC)
HVM-52H (UCJ)
HVM-354/54H (EK)

VB-001N BOARD

Ref. No. or Q'ty	Part No.	SP Description
1pc	A-8276-467-A	o MOUNTED CIRCUIT BOARD, VB-001N E5 (HVM-352/52H)
1pc	A-8276-4678A	o MOUNTED CIRCUIT BOARD, VB-001N C5 (HVM-354/54H)
C201	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C202	1-135-070-00	s TANTALUM, CHIP 0.1uF 10% 35V
C203	1-135-212-21	s TANTALUM, CHIP 2.2uF 20% 35V
C204	1-164-005-11	s CERAMIC, CHIP 0.47uF 25V
C205	1-135-176-21	s TANTALUM, CHIP 0.68uF 20% 35V
C206	1-126-602-11	s ELECT 3.3uF 20% 50V
C208	1-135-155-21	s TANTAL CHIP 4.7uF 10% 16V
C209	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C210	1-126-397-11	s ELECT, CHIP 33uF 20% 25V
C211	1-135-211-11	s TANTALUM 6.8uF 20% 6.3
C213	1-135-181-21	s TANTALUM, CHIP 4.7uF 10% 6.3V
C214	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C215	1-162-964-11	s CERAMIC 0.001uF 10% 50V
C301	1-162-916-11	s CERAMIC, CHIP 12PF 5% 50V
C302	1-162-916-11	s CERAMIC, CHIP 12PF 5% 50V
C303	1-162-964-11	s CERAMIC 0.001uF 10% 50V
C305	1-135-157-21	s TANTALUM, CHIP 10uF 10% 6.3V
C306	1-135-157-21	s TANTALUM, CHIP 10uF 10% 6.3V
C307	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C308	1-135-157-21	s TANTALUM, CHIP 10uF 10% 6.3V
C309	1-162-912-11	s CERAMIC 7PF 0.5PF 50V
C310	1-162-912-11	s CERAMIC 7PF 0.5PF 50V
C401	1-126-206-11	s ELECT 100uF 20% 6.3V
C402	1-135-157-21	s TANTALUM, CHIP 10uF 10% 6.3V
C403	1-164-156-11	s CERAMIC 0.1uF 25V
C404	1-135-177-21	s TANTALUM, CHIP 1uF 10% 20V
C405	1-162-922-11	s CERAMIC, CHIP 39PF 5% 50V
C406	1-162-919-11	s CERAMIC, CHIP 22PF 5% 50V
C407	1-135-202-21	s TANTAL 22uF 20% 4V
C408	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C409	1-124-778-00	s ELECT 22uF 20% 6.3V
C410	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C411	1-135-181-21	s TANTALUM, CHIP 4.7uF 10% 6.3V
C412	1-135-181-21	s TANTALUM, CHIP 4.7uF 10% 6.3V
C413	1-135-155-21	s TANTAL CHIP 4.7uF 10% 16V
C414	1-135-155-21	s TANTAL CHIP 4.7uF 10% 16V
C415	1-135-157-21	s TANTALUM, CHIP 10uF 10% 6.3V
C416	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C417	1-162-970-11	s CERAMIC, CHIP 0.01uF 10% 25V
C418	1-126-206-11	s ELECT 100uF 20% 6.3V
C452	1-164-156-11	s CERAMIC 0.1uF 25V
CN201	1-568-335-61	s CONNECTOR, BOARD TO BOARD 18P
CN202	1-950-771-11	o HARNESS (CONNECTOR ASSY 2P)
CN203	1-946-454-11	o HARNESS (CONNECTOR ASSY 2P)
CN204	1-950-773-11	o HARNESS (CONNECTOR ASSY 4P)
D201	8-719-820-05	s DIODE 1SS181
D202	8-719-800-76	s DIODE 1SS226
D203	8-719-820-05	s DIODE 1SS181
D204	8-719-404-46	s DIODE MA110
D401	8-719-800-76	s DIODE 1SS226
IC201	8-752-327-48	s IC CXD1250N
IC301	8-752-350-26	s IC CXD1254AR-T5
IC401	8-752-053-66	s IC CXA1310AQ

(VB-001N BOARD)

Ref. No. or Q'ty	Part No.	SP Description
L201	1-412-030-11	s INDUCTOR CHIP 22uH
L301	1-412-030-11	s INDUCTOR CHIP 22uH
L401	1-410-201-51	s INDUCTOR CHIP 5.6uH
L402	1-410-196-11	s INDUCTOR CHIP 2.2uH
L403	1-412-030-11	s INDUCTOR CHIP 22uH
L404	1-412-030-11	s INDUCTOR CHIP 22uH
Q201	8-729-402-13	s TRANSISTOR XN1501
Q202	8-729-230-63	s TRANSISTOR 2SC4116-YG
Q203	8-729-230-60	s TRANSISTOR 2SA1586-YG
R201	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R202	1-216-847-11	s METAL, CHIP 150K 5% 1/16W
R203	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R204	1-216-835-11	s METAL, CHIP 15K 5% 1/16W
R205	1-216-857-11	s METAL, CHIP 1M 5% 1/16W
R206	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R207	1-216-841-11	s METAL, CHIP 47K 5% 1/16W
R208	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R301	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R302	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R303	1-216-833-11	s METAL, CHIP 10K 5% 1/16W (HVM-354/54H)
R305	1-216-864-11	s METAL, CHIP 0 5% 1/16W
R306	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R307	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R308	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R309	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R310	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R311	1-216-825-11	s METAL, CHIP 2.2K 5% 1/16W
R312	1-216-809-11	s METAL, CHIP 100 5% 1/16W
R313	1-216-809-11	s METAL, CHIP 100 5% 1/16W
R314	1-216-821-11	s METAL, CHIP 1K 5% 1/16W
R401	1-218-285-11	s METAL, CHIP 75 5% 1/16W
R402	1-216-845-11	s METAL, CHIP 100K 5% 1/16W
R403	1-216-818-11	s METAL, CHIP 560 5% 1/16W
R404	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R405	1-216-829-11	s METAL, CHIP 4.7K 5% 1/16W
R406	1-216-864-11	s METAL, CHIP 0 5% 1/16W
R407	1-216-857-11	s METAL, CHIP 1M 5% 1/16W
R408	1-216-833-11	s METAL, CHIP 10K 5% 1/16W
R409	1-216-826-11	s METAL, CHIP 2.7K 5% 1/16W
R410	1-216-824-11	s METAL, CHIP 1.8K 5% 1/16W
R451	1-216-834-11	s METAL, CHIP 12K 5% 1/16W
R452	1-216-838-11	s METAL, CHIP 27K 5% 1/16W
RV201	1-238-092-11	s RES, ADJ CERMET 47K
RV202	1-238-092-11	s RES, ADJ CERMET 47K
RV401	1-238-092-11	s RES, ADJ CERMET 47K
RV403	1-238-092-11	s RES, ADJ CERMET 47K
RV404	1-238-087-11	s RES, ADJ CERMET 1K
X301	1-579-121-11	s VIBRATOR, CRYSTAL 28.63636MHz (HVM-352/52H)
X301	1-579-122-11	s VIBRATOR, CRYSTAL 28.375MHz (HVM-354/54H)

6-3. PACKING MATERIAL & ACCESSORY

Ref. No. or Q' ty	Part No.	SP Description
1pc	3-178-682-01	o INDIVIDUAL CARTON (HVM-52H)
1pc	3-178-684-01	o INDIVIDUAL CARTON (HVM-54H)
1pc	3-178-693-01	o INDIVIDUAL CARTON (HVM-352)
1pc	3-178-696-01	o INDIVIDUAL CARTON (HVM-354)
2pcs	3-178-695-01	o CUSHION
1pc	△3-755-604-12	s MANUAL, INSTRUCTION (HVM-352/354)
1pc	3-795-581-21	o SAFEGUARD, IMPORTANT (HVM-352)

HVM-352 (UC)
HVM-354 (EK)
HVM-52H (UCJ)
HVM-54H (EK)
9-977-178-01

Sony Corporation
Camera Products Group

Printed in Japan
1992. 10 08
© 1992
Published by B&P Marketing Group